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15-100 CONTROL PROCESSOR

The control processor is made up of eight cards (16K words of storage positions that can be addressed). Six cards are for the control processor logic and two 16K byte cards are for the control storage. The control processor does the following:

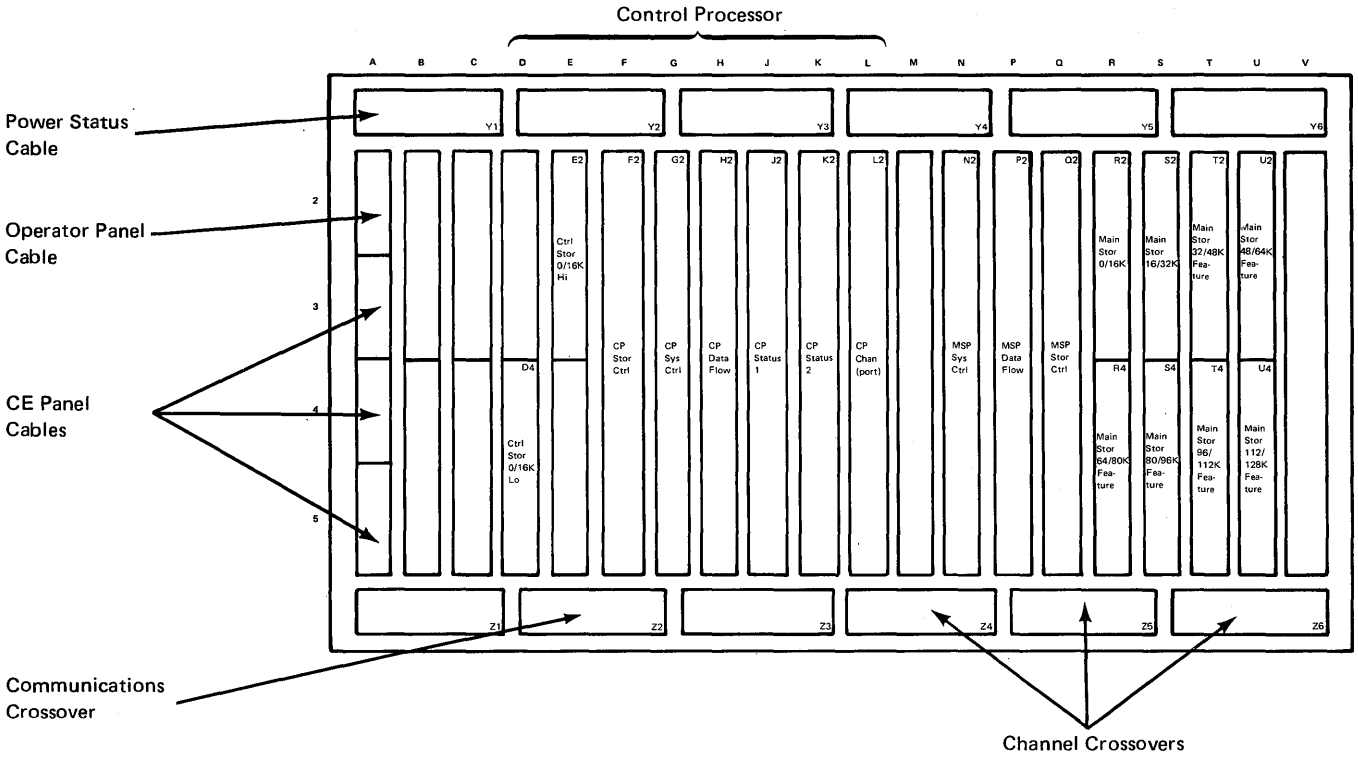
- Aids in controlling system input/output operations
- Moves data between the input/output devices and the main storage processor
- Handles some of the system control programming

15-110 CARD LOCATIONS AND USES

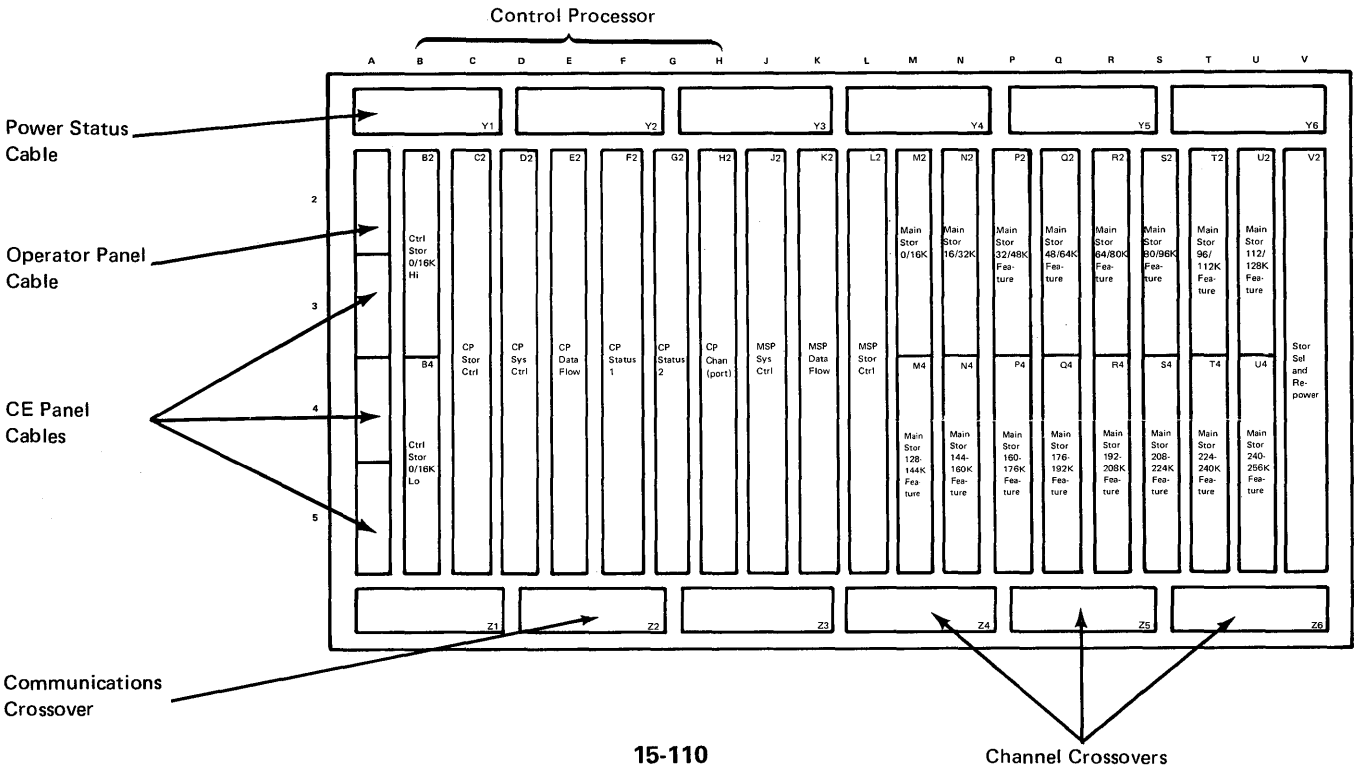
Board A-A1 has two different board/card arrangements (level 1 and level 2). To determine if the level of the board/cards is level 1 or level 2, check card location B2. If a card is in this location, level 2 board/cards are installed.

The control processor cards and the hardware on each card are as follows for each of the two levels:

A-A1 (Level 1)



A-A1 (Level 2)



Control Storage Cards

Control Storage High and Low

- Each card contains 16K half words (bytes) of storage.
- Two cards are used to get the 2 bytes that make up the control processor word to be addressed.
- These cards have the same part number as those used in main storage.

Control Storage Control

- Storage address register (SAR)
- Not valid control storage address checking
- Control storage initial program load (CSIPL) sequence control
- System reset generation
- Control storage addressing and timing
- Display bits 8 through 11
- 100-nanosecond oscillator
- Main storage processor running indicator driver

Control Processor Cards

Control Processor Control

- Micro operation register (MOR)
- Control processor clock
- Local storage register (LSR) selection
- Local storage register (LSR) write pulses
- Clocks for X-register, Y-register, and storage address register (SAR)
- Storage gate selection
- Arithmetic logic unit (ALU) gate selection
- Arithmetic logic unit (ALU) function bits, carry in, and 16-bit arithmetic logic unit (ALU) operation
- Y-gate selection
- Storage selection and controls (main storage and control storage)
- Instruction decoding
- Mode selector switch decoding
- Cycle control for console and instruction
- Timing control for arithmetic logic unit (ALU) gate and storage gate check
- Cycle steal interrupt controls
- Micro operation register (MOR) parity check

Control Processor Data Flow

- Storage data register (SDR)
- Local storage register (LSR) (64 registers–8 bits wide plus 1 parity bit)
- Storage gates
- X-register and Y-register and reset for Y-register
- Arithmetic logic unit (ALU), parity predict and control bits
- Arithmetic logic unit (ALU) gates
- Checks for arithmetic logic unit (ALU), storage data register (SDR), and storage gates

Control Processor Status

- Address compare (high byte and compare logic)
- Branch on condition
- Storage data register (SDR) (bits 4 through 7)
- Decode logic
- Processor condition register (PCR) and controls
- Processor check register
- Display bits 0 through 7, P (high byte)
- Input/output immediate decodes (control processor)
- Assembly bus
  - Console switches 1 and 2
  - Event indicators
  - Processing unit checks
  - Processor condition register (PCR)
  - Control processor bus out high byte

Control Processor Channel

- Channel register
- Channel controls
- Channel clocks
- Channel checks
- Channel interrupt
- Channel status
- Cycle steal control

Control Processor Status 2

- Input/output clocks
- Address compare (low byte and compare logic)
- Run latch
- Stop latch (main storage processor)
- Input/output immediate decodes (main storage processor)
- Display bits 12 through 15, P
- Assembly bus
  - Console switches 3 and 4
  - Console status
  - Input/output clock low byte
  - Input/output clock high byte
- Machine check latch and processor check trigger
- System in use indicator driver
- Stop indicator driver

15-200 MAIN STORAGE PROCESSOR

Level 1 A-A1 Board

The main storage processor is contained on five to eleven storage and processor logic cards. The number of cards is specified by the amount of main storage. Three cards are used for main storage processor and storage control logic, and the other two to eight cards contain storage. Various models are as follows:

- Axx = five cards for 32K bytes main storage and processor logic
- Bxx = six cards for 48K bytes main storage and processor logic
- Cxx = seven cards for 64K bytes main storage and processor logic
- Dxx = nine cards for 96K bytes main storage and processor logic
- Exx = eleven cards for 128K bytes main storage and processor logic

Level 2 A-A1 Board

The main storage processor is contained on six to twenty storage and processor logic cards. The number of cards is specified by the amount of main storage. Four cards are used for main storage processor and storage control logic, and the other two to sixteen cards contain storage. Various models are as follows:

- Axx = six cards for 32K bytes main storage and processor logic
- Bxx = seven cards for 48K bytes main storage and processor logic
- Cxx = eight cards for 64K bytes main storage and processor logic
- Dxx = ten cards for 96K bytes main storage and processor logic
- Exx = twelve cards for 128K bytes main storage and processor logic
- Fxx = twenty cards for 256K bytes main storage and processor logic

15-210 CARD LOCATIONS AND USES

The main storage processor cards and the logic on each card are as follows:

Main Storage Cards

Board A-A1 has two different board/card arrangements (level 1 and level 2). To determine if the level of the board/cards is level 1 or level 2, check card location B2. If a card is in this location, level 2 board/cards are installed.

The main storage processor cards and the hardware on each card are as follows for each of the two levels.

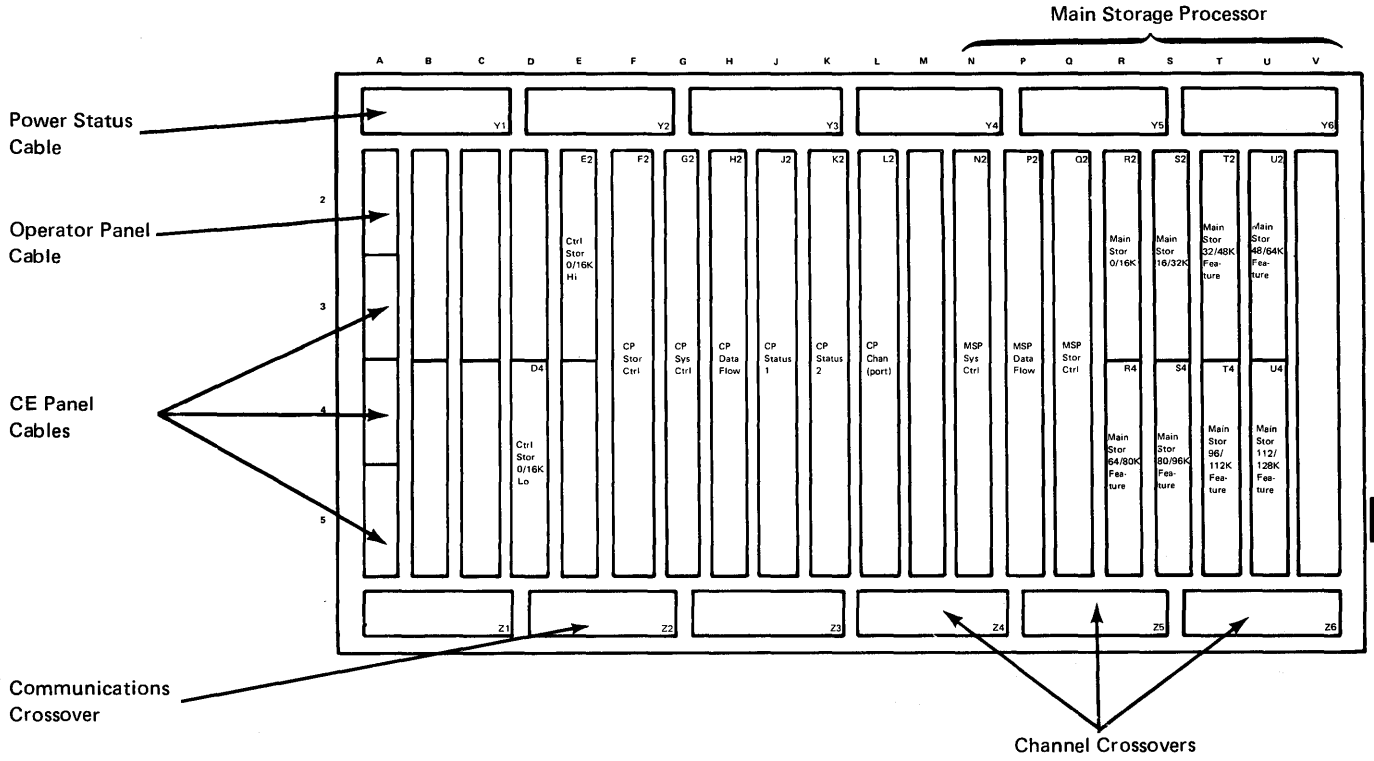
Main Storage

- Each card contains 16K bytes of storage
- Two to sixteen cards are used
- These cards all have the same part number as the cards used in control storage.

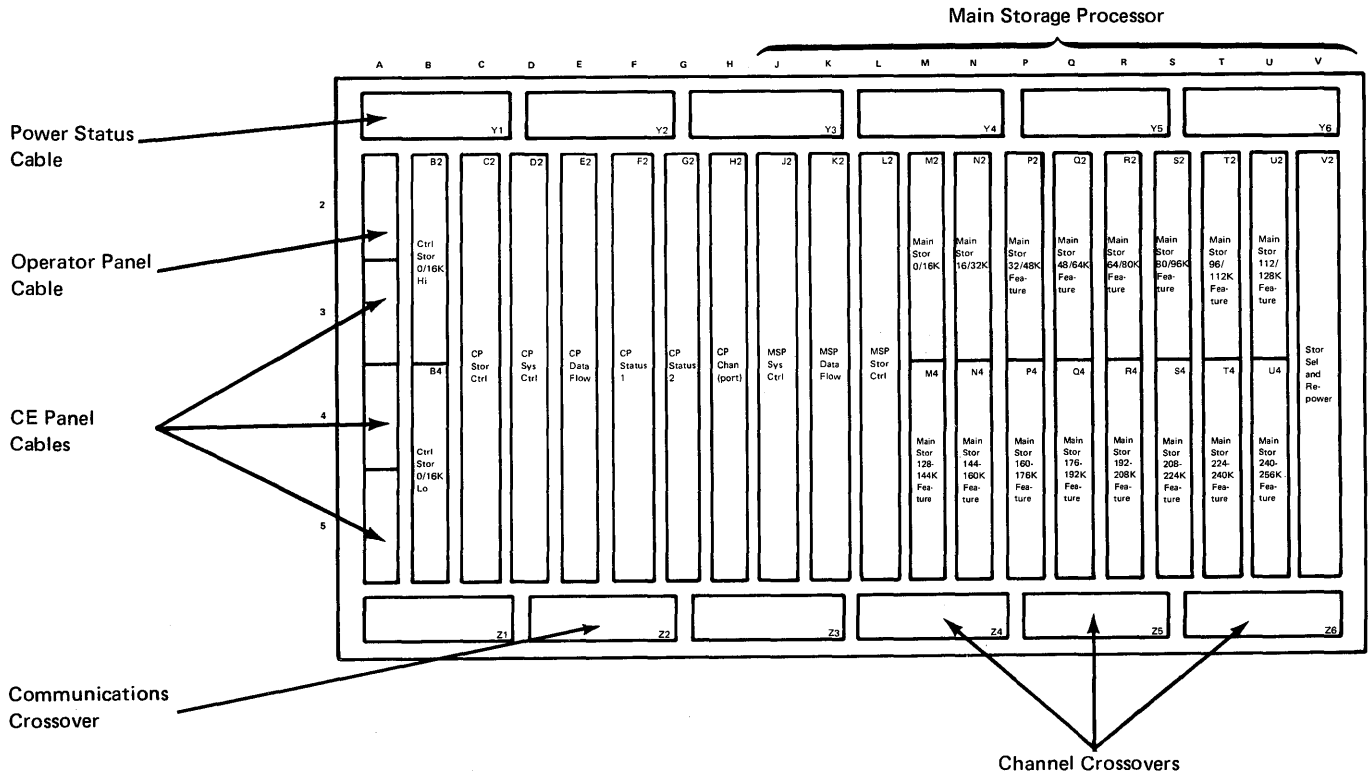
Main Storage Control

- Main storage address register (MSAR) high
- Not valid main storage address checking
- Main storage addressing and timing
- Address translation register (ATR)
- Program mode register (PMR)
- Main storage address compare
- Control mode register (CMR)
- Backup mode register (BMR)
- Mode sense gate

A-A1 (Level 1)



A-A1 (Level 2)



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Main Storage Processor Cards

Main Storage Processor Data Flow

- Arithmetic logic unit (ALU) gate
- Local storage register (LSR) gate
- Local storage register (LSR)
- X-high register, Y register, main storage address register (MSAR), X-low register
- Arithmetic logic unit (ALU), parity predict and control bits
- Main storage gate
- Gating circuits
- Parity checks–LSR gate and main storage gate

Main Storage Processor Control

- Operation register
- Q register
- Q backup register
- Control gate
- Program status register (PSR)
- Status bytes
- Status gate
- Configuration control register (CCR)
- Data flow control
  - Control gate selection
  - Arithmetic logic unit (ALU) gate selection
  - Main storage gate selection
  - Gate selection
  - X-low register and Y register selection
  - Clock main storage processor X-high register, X-low register, Y register, and main storage address register (MSAR)
  - Local storage register (LSR) selection
  - Arithmetic logic unit (ALU) bits and carry in
- Decode system instructions
- Clocks
- Control for control gate, local storage register (LSR) gate, and main storage gate checks
- Main storage controls
- Interface to the control processor

Storage Select and Repower Card

The function of this card is to repower the control, address, and data lines between the main storage processor and the lower and upper 128K bytes of main storage. The following lines are repowered:

- Control
  - MS write pulse low and high
  - MS data strobe high
  - Write main storage
- MSAR address bits 10-15
- Data
  - Data in bits 8-15, P
  - Data out bits 8-15, P